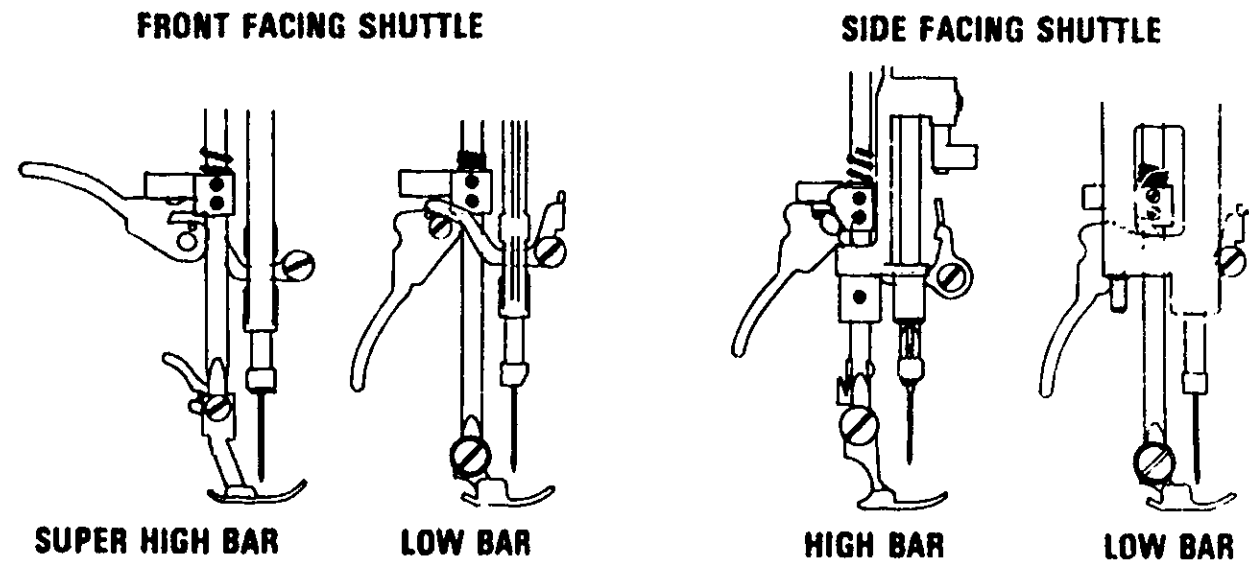
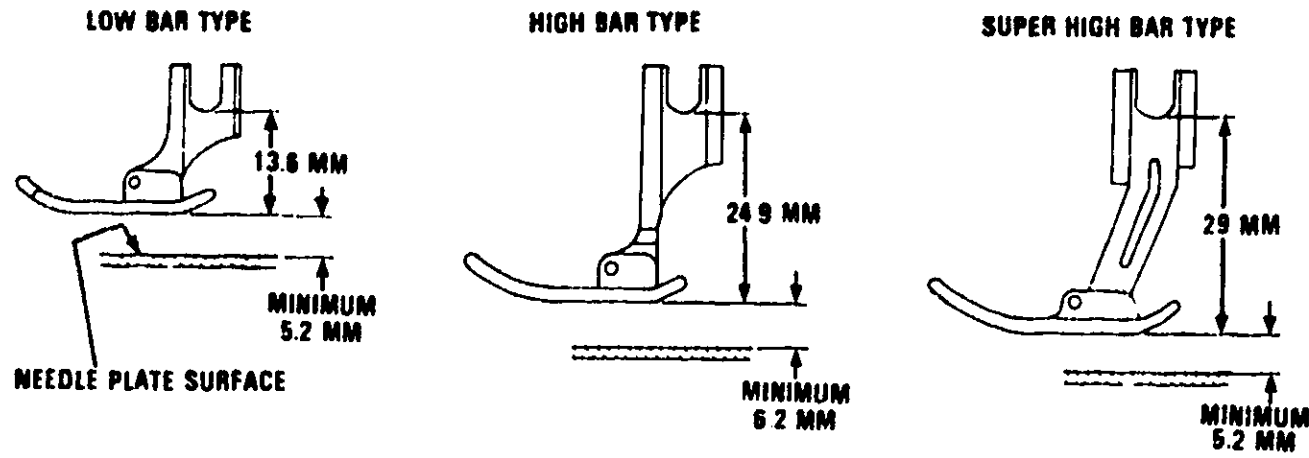


**Distribution of Needle Swing**

STRAIGHT STITCH POSITION	ATTACHMENT DIMENSION	ZIGZAG BITE	FOOT CONTROL
CENTER	LOW BAR	5.8	6813

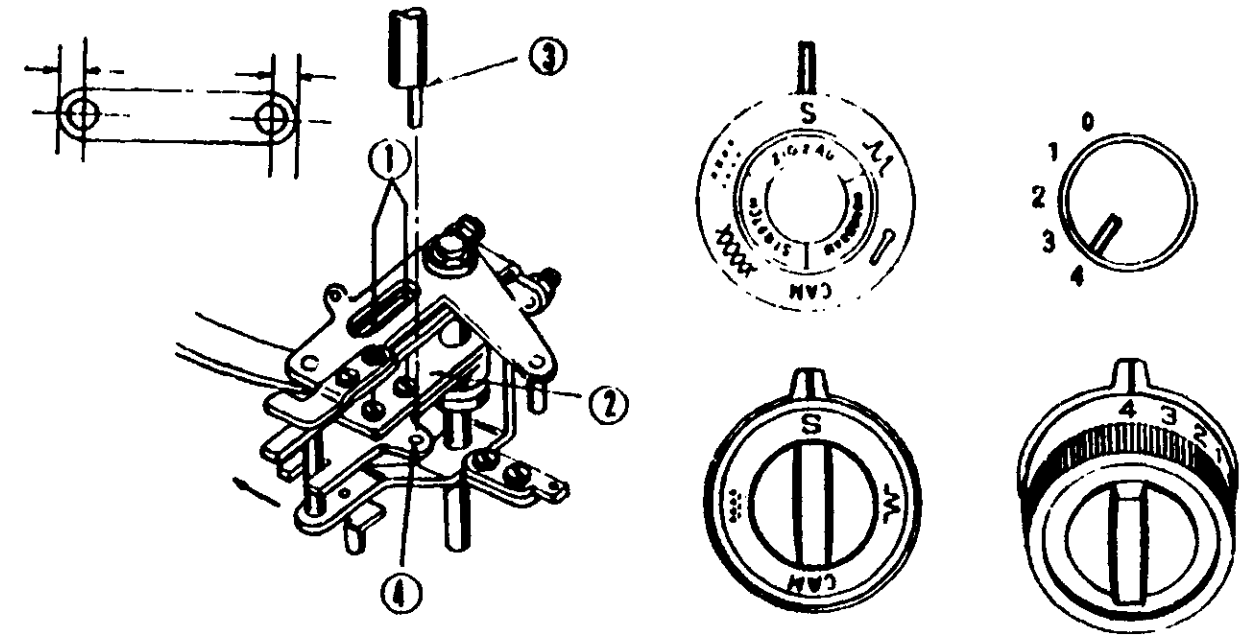
**PRESSER FOOT HEIGHT**



Drop feed dog Press dov 1 pressure regulator to the maximum pressure Lower pressure foot lever Loosen thumb screw and be sure presser foot is seated properly Tighten thumb screw  
If adjustment is necessary, raise presser foot lever and loosen screws on presser bar holder Adjust the height of presser foot from needle plate as specified Confirm the height of presser foot by a complete turn of the handwheel Tighten the screws securely after adjustment

**FIGURE A-1**

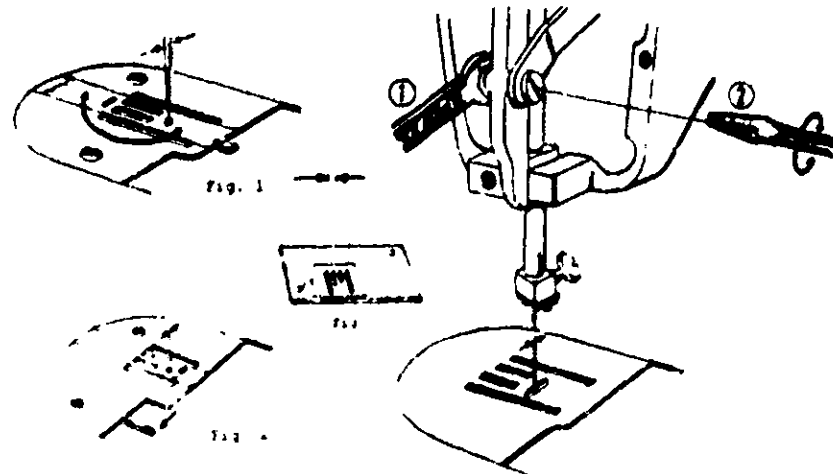
SET THE SELECTOR DIAL AT S AND STITCH WIDTH CONTROL KNOB 4. BRING NEEDLE TO THE LOWEST POSITION. LOOSEN SET SCREWS (1) SLIGHTLY, INSERT THE ECCENTRIC TOOL (4) INTO THE HOLE (5) AND SLIDE THE ZIGZAG CAM FOLLOWER (3) IN THE DIRECTION INDICATED BY THE ARROW BY TURNING THE ECCENTRIC TOOL UNTIL YOU CAN OBTAIN EQUAL CLEARANCE BETWEEN THE NEEDLE AND THE EDGE OF THE NEEDLE SLOT AT BOTH LEFT AND RIGHT NEEDLE POSITIONS. TIGHTEN THE SCREWS SECURELY AFTER ADJUSTMENT.



**FIGURE C-7**

**Needle Position**

Set stitch width control at 0. Prepare the needle plate for straight stitching by reversing or sliding the center plate (See Figures 1 & 2) or place the needle plate insert for straight stitch onto the needle plate (See Figure 3). Turning handwheel, check and see if the needle goes through the needle hole at its center. If not, loosen nut (1) and adjust needle position by slightly turning the eccentric roller pin (2). Tighten the nut securely after adjustment.



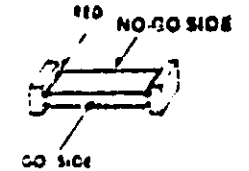
**FIGURE D-2**

**Feed Dog Height**

FOR FRONT FACING SHUTTLE MODELS, PLACE GAUGE AT POSITION AS ILLUSTRATED WITH THE NO-GO-SIDE OF THE GAUGE FACING THE NEEDLE PLATE. LOWER PRESSER FOOT. WHILE TURNING THE HANDWHEEL SLOWLY BY HAND, THE GAUGE SHOULD BE MOVED BY THE FEEDDOG TEETH. IF NOT, FEEDDOG TEETH ARE TOO LOW. THEN PLACE THE GAUGE UP-SIDE-DOWN WITH THE GO-SIDE FACING THE NEEDLE PLATE. REPEAT THE SAME PROCEDURE. THE GAUGE SHOULD NOT BE MOVED. IF THE GAUGE IS MOVED, THE FEEDDOG TEETH ARE TOO HIGH.

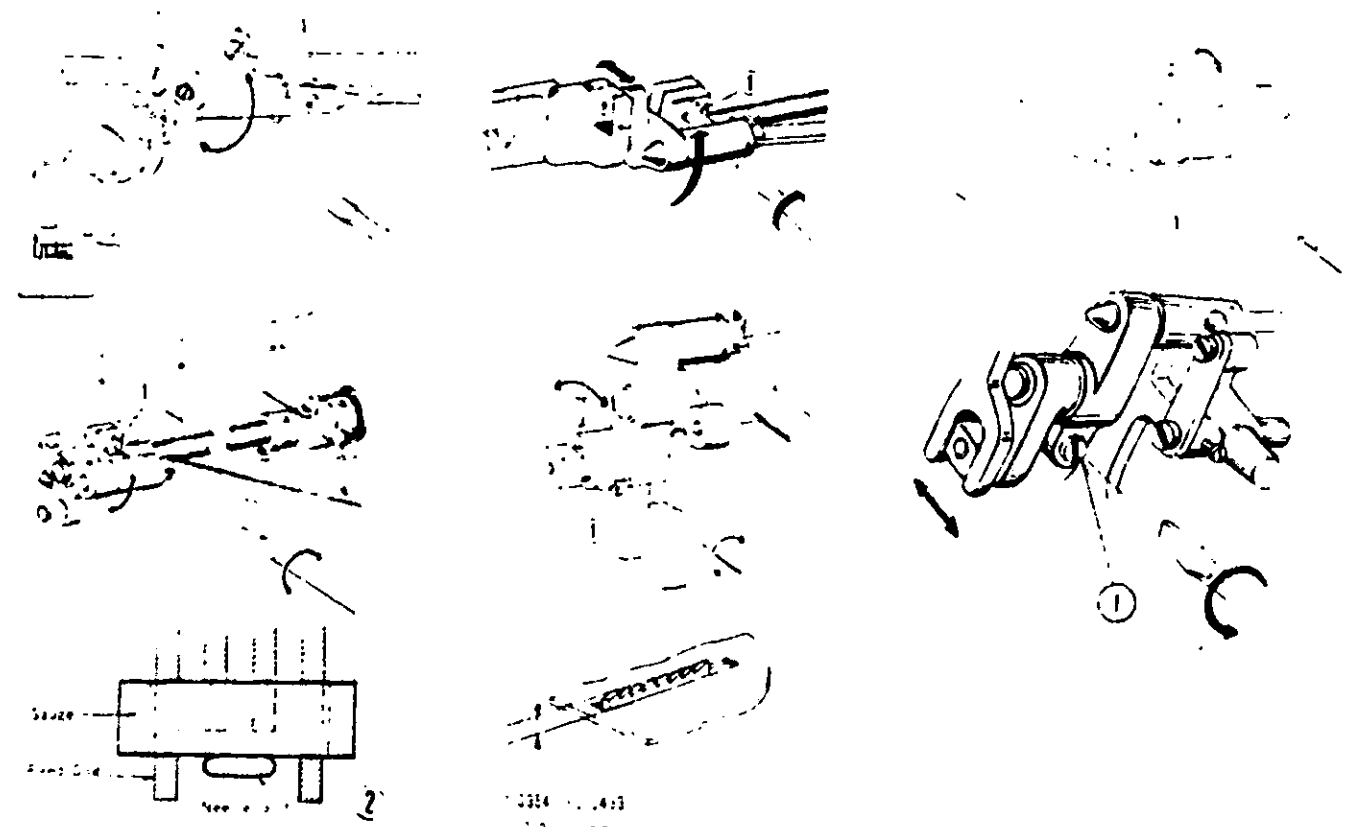
IN CHART FORM IT LOOKS LIKE THIS:

Feed Dog Height Gauge	Go-Side (Facing Needle Plate)	No-Go-Side (Facing Needle Plate)
Correct	Not Moving	Moving
Low	Not Moving	Not Moving
High	Moving	Moving



IF ADJUSTMENTS ARE NECESSARY, LOOSEN SCREW (1) ON DROP FEED CENTER BLOCK AND ADJUST THE FEEDDOG HEIGHT AS SPECIFIED. TIGHTEN THE SCREW SECURELY AFTER ADJUSTMENT.

**CAUTION:** FOR SIDE FACING SHUTTLE MODEL BE SURE THE GAUGE IS PLACED ON THE SURFACE OF NEEDLE PLATE. BE SURE ONE END IS NOT RESTING ON THE HANDHOLE COVER PLATE.



**FIGURE E-1**

**Zero-Feeding**

SET SPECIAL STITCH DIAL AT "S", STITCH WIDTH CONTROL AT "S" AND STITCH LENGTH CONTROL AT "0". TURNING HANDWHEEL, CHECK TO SEE IF THE FEED DOG MOVES HORIZONTALLY. AT THIS POSITION THE FEED DOG SHOULD NOT MOVE. IF FEED DOG MOVES, LOOSEN SCREW (1) SLIGHTLY. TURN ECCENTRIC SCREW (2) EITHER CLOCKWISE OR COUNTERCLOCKWISE UNTIL MACHINE DOES NOT FEED ON THE "0" SETTING. TIGHTEN SCREW (2) SECURELY AFTER ADJUSTMENT.

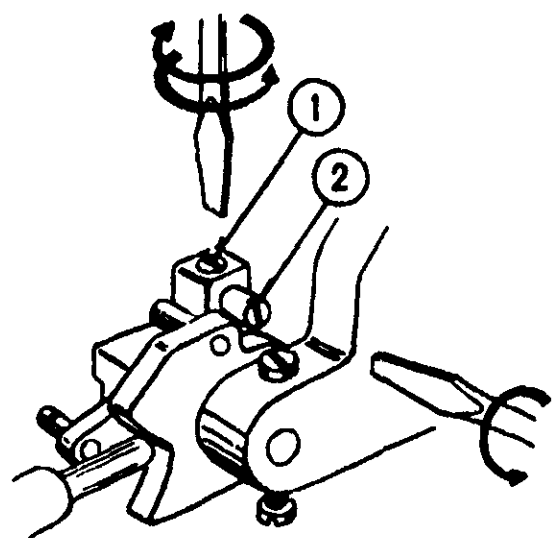
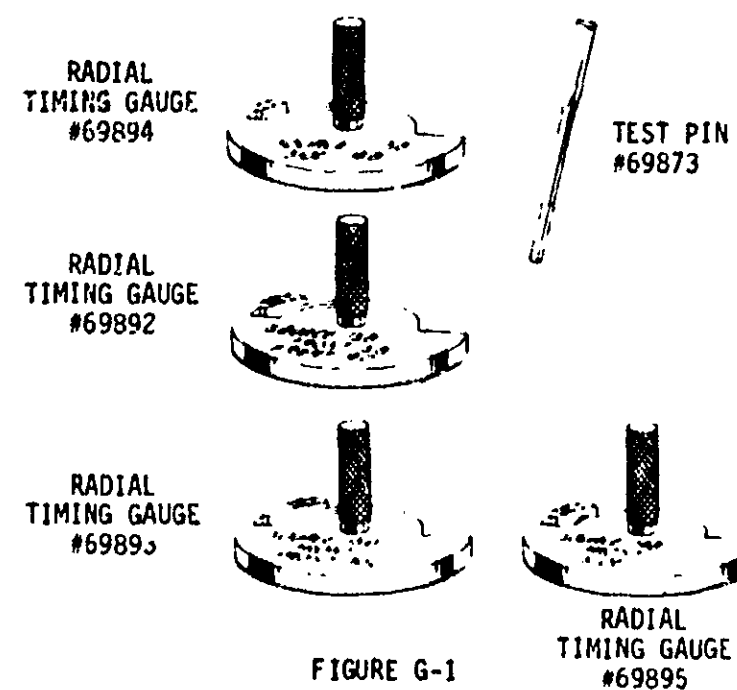


FIGURE F-7

**NEEDLE TIMING TO SHUTTLE  
NEEDLE BAR HEIGHT**

THE RADIAL TIMING GAUGES AND TEST PINS, AS ILLUSTRATED BELOW, ARE AVAILABLE FROM DIVISION 92, SOURCE 192. THE KIT IS IDENTIFIED AS #69659. EACH GAUGE AND TEST PIN CAN ALSO BE ORDERED INDIVIDUALLY.

THIS KIT IS USED FOR SOURCE 148 AND 158 VERTICAL BOBBIN SEWING MACHINES.



## NEEDLE TIMING TO SHUTTLE

### Needle Clearance to Shuttle

The clearance "a," "b," "c," and the angle "d" are very critical points in relation to the needle timing to shuttle. However, these points are visually determined by using the Radial Timing Gauges.

#### NOTE:

No adjustment is allowed for "Dimension C" for the front-facing shuttle models. For adjustment for side-shuttle models, please refer to Figure G-3.

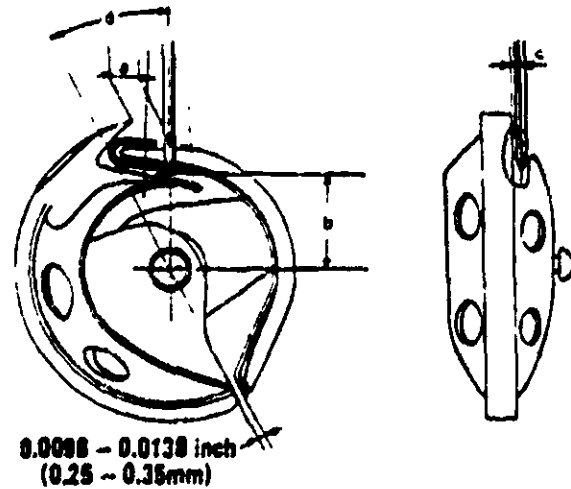


FIGURE G-2

Do not attempt adjustments other than those specified in this manual. If, by following the prescribed procedures, it is determined that a machine is out of radial time, handle per Bulletin S-820.

### Radial Timing Gauge Instructions

- 1 Remove needle and replace it with test pin which has a blunt tip
- 2 Insert correct radial timing gauge into shuttle driver  
Use gauge marked  
Source 158 FRONT 70 FRONT 70D  
Use FRONT 70D marking

- 3 Set stitch control at "0" or "S" (depending on model involved)

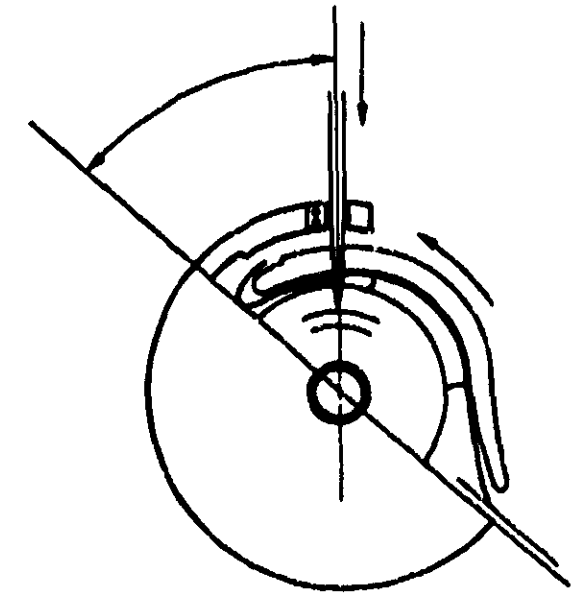
On machines with 70 zigzag bite which have a left needle straight stitch position, center the needle by means of the stitch width control. Use center strip between rear feeddogs as a guide for centering the needle.

- 4 Set needle position control at center for models which have this control

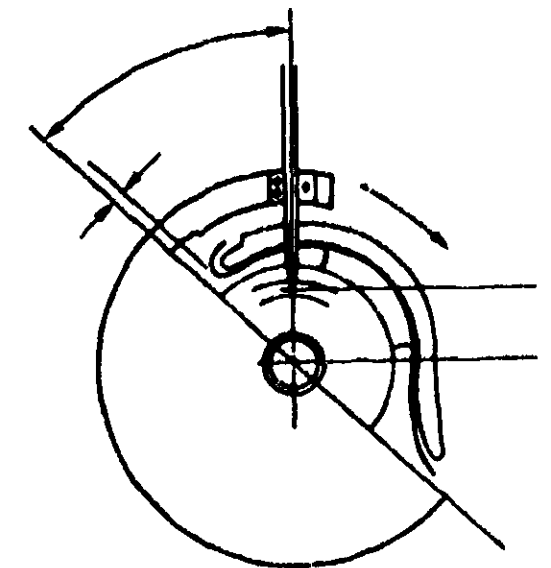
- 5 Rotate handwheel slowly by hand (See Figure G-3a) The test pin should come between the correct two vertical lines at the end of the counterclockwise rotation of the gauge.

- 6 To check needle bar height, continue to rotate handwheel slowly by hand (See Figure G-3b) At the lowest position of the needle bar, the end of the test pin should come between two horizontal lines on the gauge.

If necessary, adjust needle bar height. Loosen screw on needle bar holder and adjust height on the test pin.



DIMENSION A



DIMENSION B

FIGURE G-3

**Zigzag Synchronization**

Set stitch width control at maximum. Turning the handwheel, check and see if the needle side motion on the standard plane (0.0384 inch above the upper surface of the needle plate) at both needle positions

come within the engineering limit of 0.0138 inch. If not, loosen set screw (2) on the worm gear either direction. Tighten the screw (2) securely after adjustment.

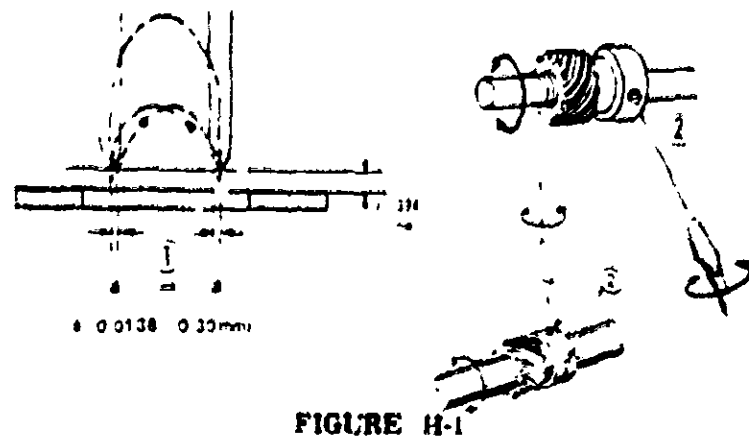


FIGURE H-1

**Straight Stitching**

SET STITCH WIDTH CONTROL AT "S". TURNING HANDWHEEL SLOWLY, CHECK TO SEE IF THE NEEDLE SWINGS. IT SHOULD NOT SWING. IF ADJUSTMENT IS NECESSARY, LOOSEN SCREW (1) AND MOVE THE ZIGZAG WIDTH ARM (2) TO THE EXTREME LEFT POSITION. TIGHTEN THE SCREW SECURELY AFTER ADJUSTMENT.



FIGURE I-4

**Automatic Reverse Stitching Buttonhole**

If the length of reverse stitches is shorter or longer than that of forward stitches, the adjustment is made by the following procedure:

Loosen the set screw (1), and pull off the knob (2). Adjust the dial shaft (3) by turning either way until you can obtain the correct pattern. After adjustment, place the knob (2) onto the shaft correctly directing it upward as illustrated. Tighten the screw (1) securely. It is necessary to have a slight gap between the knob surface and arm side. After this adjustment the automatic mechanism must also be checked as described for Figure K-9.

Example of forward and reverse stitches equal in length

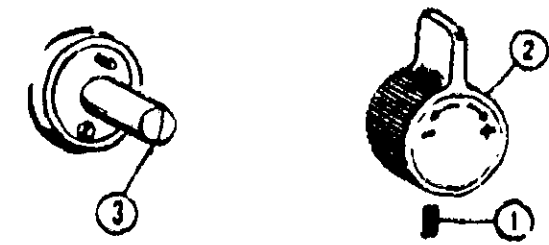


FIGURE J-6

**Automatic Mechanism Cam and Cam Follower Mechanism**

If the selector dial can not be turned, it may be due to insufficient clearance between the cam and the cam follower. Excessive clearance however, will result in an irregular pattern.

To adjust the mechanism, set the stitch width control at 2, and the selector dial at the center point of the buttonhole mark and the word "CAM" as illustrated. Loosen the lock nut (1), set screws (2) and (3) until you can get a slight movement of claw opening plate (4). Move the claw opening plate (4) in either direction as shown until you can get the correct clearance (.004 - .008 inch) between the highest point of the cam and the cam follower. Tighten the screws and nut (1), (2), (3) securely.

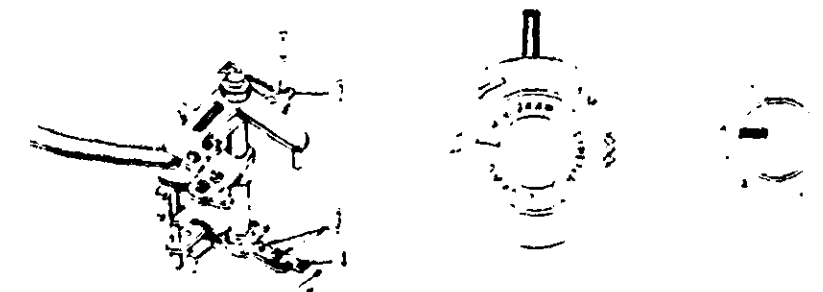


FIGURE K-10